Enclosure A

DRAFT

Anadromous Fish Non-Discretionary Project List for FY 1999

These contracts provide analytical capabilities and analyses needed for fish mitigation and fish impact assessments required of BPA and other federal agencies for compliance with ESA, NEPA, and the NW Power Act. The contracts provide critical information needed to help focus mitigation efforts to achieve positive fish recovery results with efficient use of limited mitigation funds on both a real-time and planning horizon basis. Much of this work is currently both direct and indirect support for PATH, ESA Biological Assessments and consultations, and In-Season management decisions. BPA needs and uses the support provided by these contracts to accountably perform certain intrinsic governmental responsibilities that may not be transferred to other entities or voided. Chief among these is preservation of the Federal agency's ability to independently make decisions related to operations of the hydrosystem and commitment of fiscal and material federal resources for fish and wildlife mitigation programs.

A brief descriptive project summary for each of these non-discretionary contracts follows. Additional project specific information on results and accomplishments, applications and publications, relationships and contributions to other projects, rationale and significance to FWP and other regional programs, information/technology transfer, adaptive management implications, history, key personnel, and proposed objectives, tasks, expected products and estimated costs by time and task for FY99 work originally proposed by contractors, is provided on the Internet at address:

http://www.efw.bpa.gov/Environment/EW/PROPOSALS/AIWP/NONDIS/nondis.htm

Project 93-037-01: Technical Assistance with Life Cycle Modeling - Paulsen Environmental Research

BPA Contact: Jim Geiselman

FY 99 Forecast: $175,000

FY98 Funding: $175,000

Project Requirements: This contract is with Charles Paulsen and provides ongoing independent scientific support for statistical and life-cycle analyses for BPA's participation in the PATH process and in consultation processes for ESA listed species. Analyses are used to help distinguish among competing hypotheses on wild fish survival in relationship to hydro passage conditions, habitat quality, hatchery releases, harvest and ocean conditions. In addition, the contract provides assistance in the development of methods and analyses needed to identify information that can be obtained from adaptive management actions and associated monitoring activities to address the high levels of uncertainty in the effectiveness of alternative management actions. The contract helps ensure that results are communicated effectively to regional

specialists and decision managers. The contract includes a subcontract for $30,000 with Beak Consultants for support in data research, synthesis, and documentation. Direct participation is provided in PATH working groups and through the development and review of working group products.

Project 96-017-00: Provide Technical Support in the Plan for Analyzing and Testing Hypotheses - BioAnalysts Inc.

BPA Contact: Jim Geiselman

FY99 Forecast: $108,887

FY98 Funding: $110,000

Project Requirements: The contract is for work performed primarily by Dr. Al Giorgi and provides ongoing independent scientific support for analyses of hydro related hypotheses and management actions for BPA's participation in the PATH process and in consultation processes for ESA listed species. The contract ensures independent expertise in mainstem passage data, research, and analyses for the hydro subgroup within PATH. In particular, the analysts identify the availability, quality and applicability of historic passage data for use in modeling spring and fall chinook and steelhead. The analysts also assist modelers in the proper interpretation and application of relevant information in the construct of submodels and functions. The contract provides support in designing and evaluating diagnostic analyses during model development and revision. In addition to direct technical support, the contractor will coordinate/facilitate the activities of the PATH hydro subgroup on fall chinook and provide scientific review for other PATH subgroups and work products. The analysts have and will continue to write issue papers dealing with smolt and adult passage mechanisms and survival estimates in relationship to hydro operations, as requested by various work group leaders.

Project 98-001-00: Analytical Support - PATH and ESA Biological Assessments - Hinrichsen Environmental Services

BPA Contact: Jim Geiselman

FY99 Forecast: $119,900

FY98 Funding: $99,580

Project Requirements: This contract provides ongoing independent scientific support from Dr. Richard Hinrichsen for BPA's participation in PATH and ESA assessments of the expected effectiveness of management actions in the face of high levels of uncertainty. Specific expertise in the area of mathematics and statistics is applied to the understanding of those uncertainties. As part of the modeling efforts underway through PATH, the contract provides participation in

PATH working groups to help develop model structures that allow a larger array of hypotheses to be included in the evaluations. The contract provides techniques needed to test the assumptions of the models used in decision support and provide further quantification of the uncertainties in the decision analysis. The project also provides support for adaptive management design questions such as required sample sizes and the size of responses needed to meet statistical tests. Direct participation is provided in PATH working groups and through review of PATH products.

Project 97-002-00: PATH - UW Technical Support - University of Washington

BPA Contact: Jim Geiselman

FY99 Forecast: $302,289

FY98 Funding: $265,116

AND

Project 98-006-00: Technical Support For PATH - James Anderson Consulting

BPA Contact: Jim Geiselman

FY99 Forecast: $50,000

FY98 Funding: $50,760

Project Requirements: These two contracts provide independent scientific support to the regional PATH process in the identification and assessment of key alternative hypotheses and proposed management actions relating to salmon stock recovery and rebuilding in the Columbia River ecosystem. These projects will provide participation in PATH work groups and provide tools and analyses for the PATH evaluations of management actions. This support includes the development and use of statistical and mechanistic models of salmon life-cycle stages in various habitats including the mainstem (juveniles and adult passage), tributaries, estuary, and ocean. The contract provides critiques and evaluations of the suitability of the mathematical frameworks on which the biological and ecological mechanisms of PATH hypotheses are formulated. Anthropogenic and environmental factors at each salmon life stage are approached in a multi-faceted approach involving qualitative descriptions, statistical data analysis, Bayesian maximum likelihood estimation techniques, and mechanistic models. Alternative hypotheses are tested according to their mathematical rigor, the realism of their ecological mechanisms and their ability to fit available data and data patterns. Direct participation is provided by Dr. James Anderson and other scientists at the University of Washington in PATH working groups and through review of PATH products.

Project 89-108-00: Monitoring and Evaluation Modeling Support - University of

Washington

BPA Contact: Jim Geiselman

FY99 Forecast: $344,846 (Note: Costs related to maintenance, operations and services of Second-Tier Database are now incorporated under Project 96-019-00).

FY98 Funding: $364,239

Project Requirements: This contract provides independent scientific support to BPA and the region from an inter-disciplinary team of scientists for modeling and evaluation of the effects of Columbia and Snake River hydrosystem operations and salmon recovery plans on fish migration and survival. The project provides tools to conduct scientific ecosystem-based evaluations of the impacts of specific fish mitigation actions. Specific work includes the development of adult and juvenile passage models, development of a multi-species selective stock harvest model, development of a water quality model, and within-season analysis of juvenile and adult river passage.

<u>Project 91-051-00:</u> Monitoring and Evaluation Statistical Support for Life-Cycle Studies - UW

BPA Contact: Pat Poe

FY99 Forecast: $320,000 (Note: Costs related to maintenance, operations and services of Second-Tier Database are now incorporated under Project 96-019-00).

FY98 Funding: $309,960

Project Requirements: This contract provides BPA and the Northwest fisheries community with independent state-of-the-art, high-quality statistical assistance and guidance on the design and analysis, and interpretation of fish tagging studies and other research that improves monitoring and evaluation capabilities and the information available for decision making. This contract provides independent scientific and statistical support for life-cycle studies for BPA's participation in consultation processes related to ESA listed species and in-season operations of the hydrosystem. This contract develops new ways of extracting life-cycle information from existing tagging data and provides recommendations on ways to improve existing studies. This contract work is performed under the direction of Dr. John Skalski. This contract includes a subcontract with BioAnalysts Inc. for $44,000 for support in statistical analysis of historical tagging data and statistical support to the region.

The technical assistance and products provided and disseminated through this contract are needed to assure data consistency and comparability related to performance measures and assessment of results through time to maximize learning and adaptive management opportunities, and to improve and maintain the ability to responsibly evaluate the success of implemented salmonid

mitigation programs and identify future mitigation options. This contract is also needed to help resolve statistical and data analysis issues so that management institutions can focus on management baselines and biological or resource issues rather than on data analysis uncertainties. This contract complements, but does not duplicate analytical services and/or other critical information products provided through other BPA contracts.

This contract performs tasks to analyze and interpret tagging data in ways that other research entities currently do not perform to maximum learning and understanding so that the "best available information" can be used in decision making. This contract performs analysis and integration of historic and in-season mainstem migration timing data collected by the Smolt Monitoring Program and other mainstem research projects on wild and hatchery-reared salmonid smolts, with emphasis on Snake River and Mid-Columbia wild threatened or endangered stocks. This contract has developed new approaches and tools which generate on-line Internet-based information including real-time in-season predictions of the general migration status of Columbia and Snake River smolt outmigrations. This contract provides an added value to historical tagging data by testing hypotheses, estimating parameters, and modeling interrelationships without the tremendous costs of additional field studies. Information is being supplied to help design and direct future research efforts and determine reliability of existing information. Historical data has and continues to be explored to reveal possible relationships between ambient river conditions and salmonid survival, outmigration timing, speed, and outmigration success. These analyses provide indirect support to the PATH process that is currently reviewing available information and assessing future information needs.

This contract promotes information/technology transfer, institutional learning, and adaptive management by: (1) providing independent monitoring and evaluation statistical support to BPA and the fisheries community; (2) developing and making statistical models, design and analysis tools, software, and Internet-based tools available to all parties to improve monitoring and evaluation capabilities; (3) providing real-time Internet-based value added information products and data integration capabilities for use by NMFS, TMT, and other members of the fisheries community to assist in-season management of fish and river resources, for example, historical timing and real-time predictions on the status of smolt migrations for ESA stocks, NMFS Snake River and Mid-Columbia River ESUs, and other Columbia Basin fish populations; and (4) publishing results on the development and design of analysis tools, the analysis of historical and real-time tagging data and other information for use by the fisheries community, the NPPC and expert scientific forums like the Independent Scientific Advisory Board (ISAB), the Independent Scientific Review Panel (ISRP) and the Plan for Analyzing and Testing Hypotheses (PATH).

The analytical and information support services provided by this contract will continue to be needed in the future to help meet the continuing demands for sound, consistent, statistical analysis of tagging data and the dissemination of results in a timely manner in order to responsibly evaluate and monitor the success of mitigation activities in the Columbia River Basin. The specific analytical support activities required each year will change to meet the needs of BPA and the Northwest fisheries community in their ongoing efforts to enhance and recover Columbia River Basin salmon runs.

Project 89-107-00: Statistical Support for Salmonid Survival Studies - UW (John Skalski)

BPA Contact: Pat Poe

FY99 Forecast: $180,000

FY98 Funding: $179,424

Project Requirements: This contract provides BPA and the fisheries community with sound independent statistical assistance and guidance on the design, conduct, analysis, and interpretation of Columbia River Basin juvenile and adult PIT-tag survival studies to assure consistency in the comparability of performance measurements so that results of management actions can be responsibly evaluated and institutional learning can be captured and applied to determine future mitigation options. This contract helps ensure that results from the conduct of Columbia River Basin survival studies are communicated effectively and made available to regional decision managers. This contract work is performed under the direction of Dr. John Skalski. The support services provided by this contract are unique and do not duplicate any other technical services provided through other BPA contracts.

This contract develops statistical methods for PIT-tag release studies to determine survival rates of outmigrating smolts and returning adults. This contract has developed some of the key statistical methods and software used to analyze data collected through the conduct of survival studies in the Columbia River Basin. Resulting improved monitoring and evaluation capabilities assists in-season evaluation and river management in optimizing operational and fish passage strategies to maximize survival through the FCRPS. This contract provides direct technical and analytical statistical support to major user group needs related to the conduct of Columbia River Basin juvenile and adult survival studies. This contract developed the initial study designs for the National Marine Fisheries Service (NMFS/University of Washington (UW) Snake river survival studies of 1993-present (e.g., NMFS Project 93-029-00). This contract continues to provide guidance on the design and analysis of ongoing investigations. Data generated by these survival studies are being used to monitor outmigration success, provide baseline information to evaluate future mitigation measures, update Columbia River models and investigate river management decisions such as flow augmentation and spill programs.

The services this contract performs assures that sound, consistent statistical methods and computational capabilities will be available to meet all of the analytical needs of NMFS and other parties now and into the future. Statistical methods are expanded and tailored to meet the changing requirements for the design and analysis of survival studies as the community needs for information grow and evolve. In 1998, these statistical capabilities are being transferred and applied to the Mid-Columbia where reach survival studies will be initiated for the first time since the early 1980s. These same capabilities for the design and analysis of tagging studies are available to all Northwest agencies and Tribes needing technical assistance in conducting survival investigations.

Continuing support for this contract is needed to respond to major user group needs for existing

and improved survival estimation analyses. In addition, as the new 134.2 kHz frequency detectors are installed, the survival studies will be extended to the joint analysis of survival of both downriver smolts and returning adults. This contract also investigates new technologies for survival studies such as radiotelemetry of smolt during outmigration to assure valid analyses of the data are performed and maximum information is extracted for management of the hydrosystem and protection of listed salmonid stocks. Moreover, this contract will continue to be needed in the future to ensure consistency in the application of sound statistical methods in the conduct of survival investigations in all salmon life-cycle stages so that results are comparable and can be used to evaluate the success of Columbia River mitigation programs.

Project 96-019-00 (1997 Proposal): Second-Tier Database Support for Ecosystem Focus

BPA Contact: Dave Askren

FY99 Forecast: $195,000

FY98 Funding : $60,000. (Note: as indicated below, the FY98 funding level did not include support from other projects.)

Project Requirements: This project provides single-point, Internet-based access to a subset of fishery, hydraulic, project operation, and environmental information vital to in-season decision making on operations of the Federal Columbia River Power System. This complements, but does not duplicate, existing historical and in-season database services provided by Project 88-108-04 (StreamNet), Project 94-033-00 (Fish Passage Center), and other regional databases by accumulating certain datasets that are reported only in single- or several-day reports from regional, primary data sources. This project also reduces user impacts to Project 90-080-00 (PITAGIS) which prioritizes data polling and quality control over data analysis and presentation. A second-tier database adds value to a data set by providing ease of access and pathways for analysis.

This project provides database services critical to the Corps of Engineer's TMT internet services which are used by federal, state, and tribal entities throughout the year. This project also generates historical and inseason data sets critical to Project 91-051-00 (Monitoring and Evaluation Statistical Support for Life Cycle Studies) and Project 89-108-00 (Monitoring and Evaluation Modeling Support) which generate on-line, Internet-based forecasts of inseason passage stage and survival for ESA stocks considered by the TMT. These forecasts will be one data element included in the Internet-based administrative record of the TMT.

Since 1995, second-tier services prototyped under Projects 89-108, 91-051, and 92-071-04 benefited from the availability of no-or low-cost computer capacity, expertise, and infrastructure associated with BPA contracts with the University of Washington and Battelle Northwest Laboratory. Beginning FY99, work activities and costs associated with providing second-tier services under Projects 89-108-00 and 91-051 will be transferred to Project 96-019-00. In FY99, these services may be provided under competitive bid by either existing information services

within the F&W Program or through other sources.

Project 97-010-00: Transition Project for PIT Tag Detection

BPA Contact: John Rowan

FY99 Need: $800,000

FY98 Funding: $1,595,800 (does not include carry-forward of $443,745)

Project Requirements: The identified funds are necessary to continue with the significant investment being made in FY98 to complete the transition to the ISO system in time for the Year 2000 out-migration. Funds needed in FY99 will go to construction of monitoring site access platforms, fiber optics and electrical connections for the ISO monitors and related computers, replacement of aluminum shields at various projects, and purchase of portable PIT tag detectors for use in the field.

A functional and well-maintained detection system is fundamental to performing mainstem research, monitoring, and evaluation. This project changes out the old 400 kHz stationary monitors on the mainstem Columbia and Snake Rivers and replaces them with the new 134.2 kHz frequency. The ability to maintain the existing system for an extended period of time is extremely limited. As a result, the transition is essential to ensure the region is able to continue collecting PIT tag data. A considerable amount of time and money has been expended in developing and testing prototype stationary and portable monitors, and the implementation phase is well under way. Deferring FY99 funds would add to the total costs, rather than decrease them and would increase the risk of losing detection capability with the existing 400 kHz system.